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Montana
Basin Outlook Report
January 1, 1999

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How forecasts are made

Most of the annual streamflow in the Western United States originates as snowfall that has accumulated high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are combined with snowpack data to prepare runoff forecasts. Streamflow forecasts are coordinated by Natural Resources Conservation Service and National Weather Service hydrologists. This report presents a comprehensive picture of water supply conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data, and narratives describing current conditions.

Snowpack data are obtained by using a combination of manual and automated SNOTEL measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation and temperature are monitored on a daily basis and transmitted via meteor burst telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

Forecast uncertainty originates from two sources: (1) uncertainty of future hydrologic and climatic conditions, and (2) error in the forecasting procedure. To express the uncertainty in the most probable forecast, four additional forecasts are provided. The actual streamflow can be expected to exceed the most probable forecast 50% of the time. Similarly, the actual streamflow volume can be expected to exceed the 90% forecast volume 90% of the time. The same is true for the 70%, 30%, and 10% forecasts. Generally, the 90% and 70% forecasts reflect drier than normal hydrologic and climatic conditions; the 30% and 10% forecasts reflect wetter than normal conditions. As the forecast season progresses, a greater portion of the future hydrologic and climatic uncertainty will become known and the additional forecasts will move closer to the most probable forecast.

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Bozeman, Montana

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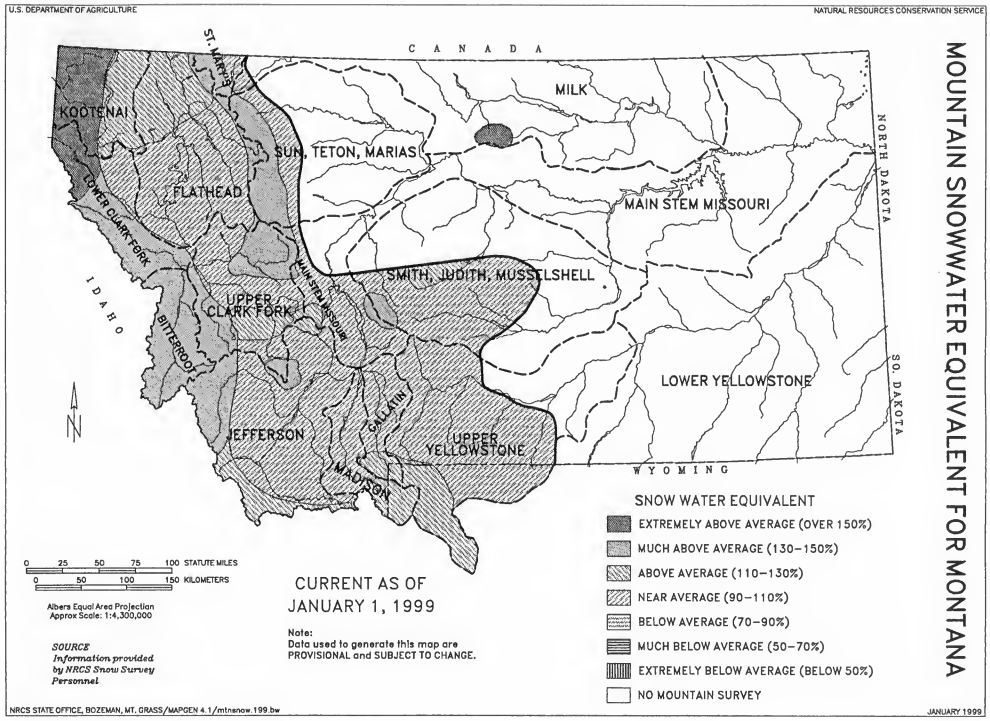
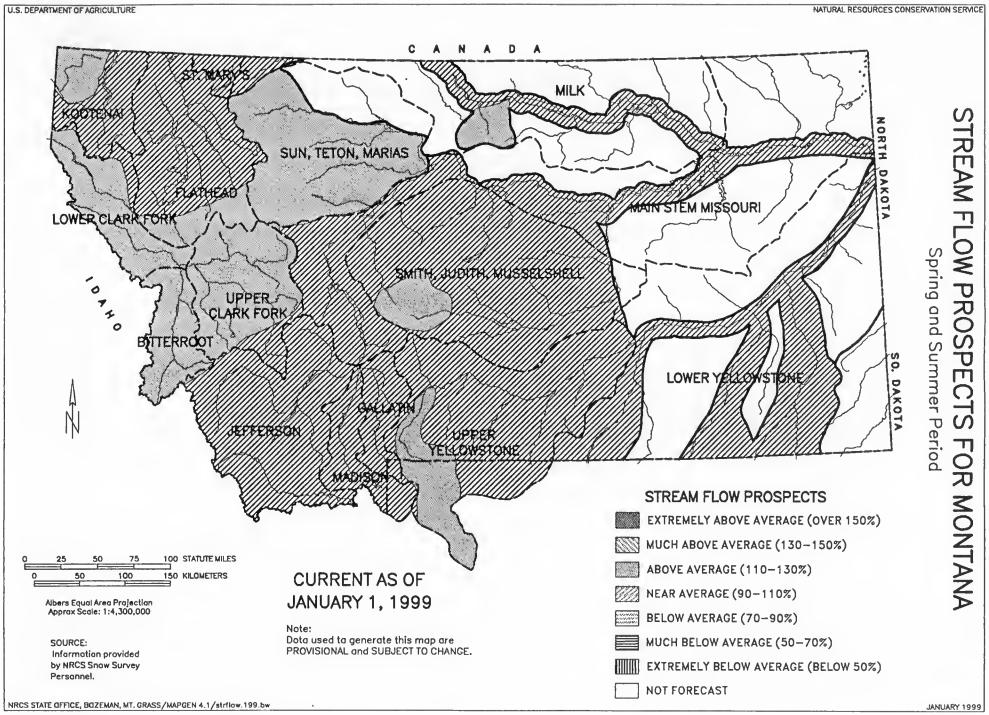

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
MOUNTAIN SNOWWATER EQUIVALENT FOR MONTANA
CANADA
ST. MARY'S
KOOTENAI
SUN, TETON, MARIAS
MILK
FLATHEAD
MAIN STEM MISSOURI
NORTH DAKOTA
LOWER CLARK FORK
SMITH, JUDITH, MUSSELSHELL
MAIN STEM MISSOURI
IDAHO
UPPER CLARK FORK
BITTERROOT
LOWER YELLOWSTONE
SO. DAKOTA
N
JEFFERSON
GALLATIN
UPPER YELLOWSTONE
MADISON
WYOMING
0 25 50 75 100 STATUTE MILES
0 50 100 150 KILOMETERS
Albers Equal Area Projection
Approx Scale: 1:4,300,000
SOURCE
Information provided by NRCS Snow Survey Personnel
CURRENT AS OF JANUARY 1, 1999
Note:
Data used to generate this map are PROVISIONAL and SUBJECT TO CHANGE.
SNOW WATER EQUIVALENT
EXTREMELY ABOVE AVERAGE (OVER 150%)
MUCH ABOVE AVERAGE (130–150%)
ABOVE AVERAGE (110–130%)
NEAR AVERAGE (90–110%)
BELOW AVERAGE (70–90%)
MUCH BELOW AVERAGE (50–70%)
EXTREMELY BELOW AVERAGE (BELOW 50%)
NO MOUNTAIN SURVEY
NRCS STATE OFFICE, BOZEMAN, MT. GRASS/MAPGEN 4.1/mtnsnow.199.bw
JANUARY 1999



STREAM FLOW PROSPECTS FOR MONTANA

Spring and Summer Period

SUMMARY OF SNOTEL AND SNOW COURSE DATA

JANUARY 1999

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-90
ALBRO LAKE PILLOW	8300	1/01/99	---	10.2	6.1	10.4
ASHLEY LAKE	4000	1/01/99	---	2.6E	1.3	2.4
ASHLEY DIVIDE	4820	1/01/99	---	3.7E	1.5	3.4
BADGER PASS PILLOW	6900	1/01/99	---	20.5	10.7	14.2
BANFIELD MTN PILLOW	5600	1/01/99	---	13.4	4.4	9.0
BARKER LAKES PILLOW	8250	1/01/99	---	6.9	5.0	6.8
BASIN CREEK PILLOW	7180	1/01/99	---	5.0	4.6	3.6
BASSOO PEAK	5150	12/31/98	25	5.6	1.8	--
BEAGLE SPGS PILLOW	8850	1/01/99	---	5.6	3.7	3.7
BEAVER CREEK PILLOW	7850	1/01/99	---	7.8	5.6	7.9
BISSON CREEK PILLOW	4920	1/01/99	---	3.2	2.8	3.9
BLACK BEAR PILLOW	7950	1/01/99	---	20.1	12.7	15.6
BLACK PINE PILLOW	7100	1/01/99	---	6.9	2.7	4.9
BLACKTAIL	5650	1/01/99	---	6.7E	3.1	5.8
BLOODY DICK PILLOW	7550	1/01/99	---	6.7	4.8	5.1
BOULDER MTN PILLOW	7950	1/01/99	---	11.0	5.5	8.4
BOX CANYON PILLOW	6700	1/01/99	---	4.5	3.0	4.8
BOXELDER CREEK	5100	12/30/98	---	5.5E	1.1	4.3
BRACKETT CR PILLOW	7320	1/01/99	---	7.7	5.9	8.5
CALVERT CR PILLOW	6430	1/01/99	---	5.5	3.1	4.1
CARROT BASIN PILLOW	9000	1/01/99	---	13.8	9.4	11.9
CHESSMAN RESERVOIR	6200	12/28/98	8	2.2	.0	1.5
CLOVER MDW PILLOW	8800	1/01/99	---	7.7	6.3	7.9
COLE CREEK PILLOW	7850	1/01/99	---	4.9	7.1	7.7
COMBINATION PILLOW	5600	1/01/99	---	2.7	1.7	2.3
COPPER BOTTOM PILLOW	5200	1/01/99	---	8.5	1.9	4.7
COPPER CAMP PILLOW	6950	1/01/99	---	18.5	8.5	13.6
COYOTE HILL	4200	12/31/98	19	4.4	2.0	4.1
CRYSTAL LAKE PILLOW	6050	1/01/99	---	4.7	4.1	5.3
DAISY PEAK	7600	1/01/99	29	5.6	2.0	5.1
DALY CREEK PILLOW	5780	1/01/99	---	6.8	3.7	5.3
DARKHORSE LK. PILLOW	8700	1/01/99	---	14.9	10.0	15.5
DEADMAN CR PILLOW	6450	1/01/99	---	5.5	3.1	4.4
DISCOVERY BASIN	7050	12/30/98	23	4.6	2.7	4.4
DIVIDE PILLOW	7800	1/01/99	---	4.1	2.9	4.8
DIX HILL	6400	12/27/98	20	4.5	2.2	5.0
DUPUYER CREEK PILLOW	5750	1/01/99	---	5.6	1.3	4.8
EMERY CREEK PILLOW	4350	1/01/99	---	8.0	3.8	7.2
FISH CREEK	8000	1/05/99	25	7.2	--	4.5
FISHER CREEK PILLOW	9100	1/01/99	---	18.0	12.9	15.6
FLATTOP MTN PILLOW	6300	1/01/99	---	29.3	14.4	21.0
FROHNER MDWS PILLOW	6480	1/01/99	---	4.0	1.9	3.4
GARVER CREEK PILLOW	4250	1/01/99	---	5.9	4.8	5.1
GRAVE CRK PILLOW	4300	1/01/99	---	7.4	4.4	7.7
GRIFFIN CR DIVIDE	5150	12/31/98	29	6.6	1.2	--
HAND CREEK PILLOW	5030	1/01/99	---	6.2	3.7	5.5

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-90
HEBGEN DAM	6550	12/31/98	17	3.4	2.6	4.9
HELL ROARING DIVIDE	5770	12/29/98	60	14.8	6.5	13.0
HOODOO BASIN PILLOW	6050	1/01/99	---	26.9	12.3	19.0
JOHNSON PARK	6450	12/30/98	19	4.0	.9	3.3
KIWANIS CAMP	3720	12/30/98	10	3.2	.0	1.1
KRAFT CREEK PILLOW	4750	1/01/99	---	6.1	4.3	6.6
LAKEVIEW RDG. PILLOW	7400	1/01/99	---	6.4	2.4	5.4
LEMHI RIDGE PILLOW	8100	1/01/99	---	5.1	4.6	4.4
LICK CREEK PILLOW	6860	1/01/99	---	3.4	3.9	5.6
LONE MOUNTAIN PILLOW	8880	1/01/99	---	8.3	6.4	7.5
LOWER TWIN PILLOW	7900	1/01/99	---	8.7	6.0	9.5
LUBRECHT PILLOW	4680	1/01/99	---	2.8	1.9	2.4
LUBRECHT FOREST NO 3	5450	1/01/99	14	3.3	1.3	2.6
LUBRECHT FOREST NO 4	4650	1/01/99	4	1.0	.5	1.4
LUBRECHT FOREST NO 6	4040	1/04/99	6	1.2	.4	1.6
LUBRECHT HYDROPLOT	4200	1/01/99	11	3.1	1.2	2.8
MADISON PLT PILLOW	7750	1/01/99	---	15.4	6.5	10.1
MANY GLACIER PILLOW	4900	1/01/99	---	9.5	3.3	7.3
MARIAS PASS	5250	12/30/98	44	10.7	4.0	6.7
MAYNARD CREEK	6210	12/30/98	12	3.2	3.3	5.8
MONUMENT PK PILLOW	8850	1/01/99	---	11.1	8.3	9.5
MOSS PEAK PILLOW	6780	1/01/99	---	15.8	10.4	16.1
MT LOCKHART PILLOW	6400	1/01/99	---	14.4	7.7	8.8
MULE CREEK PILLOW	8300	1/01/99	---	9.1	5.8	6.8
NEVADA CREEK PILLOW	6480	1/01/99	---	9.7	4.2	5.7
NEVADA RIDGE PILLOW	7020	1/01/99	---	10.6	5.0	6.0
NEZ PERCE CMP PILLOW	5650	1/01/99	---	7.8	5.0	5.7
NOISY BASIN PILLOW	6040	1/01/99	---	16.7	13.4	17.2
N.F. ELK CR PILLOW	6250	1/01/99	---	6.8	2.8	4.6
NF JOCKO PILLOW	6330	1/01/99	---	20.8	15.2	19.1
N.E. ENTRANCE PILLOW	7350	1/01/99	---	5.0	2.3	4.0
OPHIR PARK	7150	12/27/98	29	6.9	3.8	7.0
PETERSON MEADOWS	7200	12/30/98	20	4.6	3.9	4.2
PICKFOOT CRK PILLOW	6650	1/01/99	---	5.9	1.9	4.9
PIKE CREEK PILLOW	5930	1/01/99	---	16.8	7.5	11.4
PIPESTONE PASS	7200	12/30/98	16	3.6	2.0	2.1
PLACER BASIN PILLOW	8830	1/01/99	---	8.0	7.1	9.4
PORCUPINE PILLOW	6500	1/01/99	---	2.1	3.1	3.2
ROCKER PEAK PILLOW	8000	1/01/99	---	6.7	5.3	6.4
ROCKY BOY PILLOW	4700	1/01/99	---	2.5	2.0	2.2
ROCKY BOY	4700	12/30/98	16	4.9	.3	1.8
SADDLE MTN PILLOW	7900	1/01/99	---	14.7	9.5	11.1
SHORT CREEK PILLOW	7000	1/01/99	---	2.3	2.1	2.5
SHOWER FALLS PILLOW	8100	1/01/99	---	8.2	9.2	10.4
SKALKAHO PILLOW	7260	1/01/99	---	14.9	8.1	9.8
S.F. SHIELDS PILLOW	8100	1/01/99	---	5.6	5.5	7.5
SPOTTED BEAR MTN.	7000	1/02/99	30	7.0	3.0	6.6
SPUR PARK PILLOW	8100	1/01/99	---	11.3	7.0	9.8
SLEEPING WOMAN PILL	6150	1/01/99	---	9.8	4.5	6.1
STORM LAKE	7780	12/30/98	28	6.6	5.4	5.4
STUART MOUNTAIN	7400	1/02/99	63	19.1	10.6	13.4
STUART MOUNTAIN PILL	7400	1/01/99	---	19.0	10.0	12.6
SUCKER CREEK	3960	12/30/98	12	3.8	.0	.6
TAYLOR ROAD	4080	12/30/98	15	4.8	.4	2.0

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-90
TEN MILE MIDDLE	6800	12/28/98	21	5.0	2.6	4.7
TEPEE CREEK PILLOW	8000	1/01/99	---	5.6	4.5	5.7
TIZER BASIN PILLOW	6840	1/01/99	---	4.5	4.2	4.8
TRINKUS LAKE	6100	1/02/99	63	18.6	10.4	18.7
TRUMAN CREEK	4060	1/01/99	---	2.3E	1.2	2.0
TV MOUNTAIN	6800	1/02/99	41	10.3	5.6	7.2
TWELVEMILE PILLOW	5600	1/01/99	---	10.7	6.1	7.2
TWENTY-ONE MILE	7150	1/01/99	40	9.0	4.2	7.3
TWIN LAKES PILLOW	6400	1/01/99	---	25.4	14.5	16.3
UPPER HOLLAND LAKE	6200	1/02/99	59	15.0	11.8	15.8
WALDRON PILLOW	5600	1/01/99	---	8.1	3.6	5.0
WARM SPRINGS PILLOW	7800	1/01/99	---	11.2	8.6	9.4
WEASEL DIVIDE	5450	12/28/98	65	18.6	9.7	15.3
WEST YELLOWSTONE	6700	1/01/99	27	5.8	2.6	4.8
WHISKEY CREEK PILLOW	6800	1/01/99	---	8.4	4.1	7.0
WHITE MILL PILLOW	8700	1/01/99	---	11.3	10.4	11.4
WOOD CREEK PILLOW	5960	1/01/99	---	6.8	1.7	4.4

Montana Water Supply Outlook Report as of January 1, 1999

Weather patterns coming into Montana have had the most impact along the continental divide between Montana and Idaho and the northern and eastern parts of Montana. Areas east of the divide and in the southwest and southcentral have had the least storm activity so far this winter. Montana had a cold air mass move in from Canada during the third week of December which brought air temperatures in many areas well below zero.

Snowpack

As of January 1, mountain snow water contents were ranging from below to well above average and 76 percent above last year at this time. Mountain snow water contents were 121 percent of average and 176 percent of last year. Mountain snowpacks are generally near or below average at middle and lower elevations, generally below 5,500 feet in the north and 7,500 to 8,000 feet in the south. West of the Continental Divide, mountain snow water content was 128 percent of average and 189 percent of last year and East of the Continental Divide, was 113 percent of average and 149 percent of last year.

The mountains of northcentral Montana have made a complete turn around from last year at this time. Snow water content is well above average and more than twice what was reported last year.

RIVER BASIN	% OF AVERAGE	% OF LAST YEAR
COLUMBIA	128	189
KOOTENAI	135#	204
FLATHEAD	118	178
UPPER CLARK FORK	126	177
BITTERROOT	149#	182
LOWER CLARK FORK	148#	223
MISSOURI	119	174
MISSOURI HEADWATERS	110	154
JEFFERSON	115	153
MADISON	112	166
GALLATIN	95	128
MISSOURI MAINSTEM	135	214
HEADWATERS MAINSTEM	130#	193
SMITH-JUDITH-MUSSELSHELL	111	176
SUN-TETON-MARIAS	150	227
MAINSTEM ABOVE FT. PECK RES	132	201
MILK	194#	566
ST. MARY	137	219
ST. MARY & MILK	152	276
YELLOWSTONE	104	123
UPPER YELLOWSTONE	107	138
LOWER YELLOWSTONE (WYOMING)	106	115
WIND	112	122
SHOSHONE	126	148
BIGHORN	109	121
TONGUE	81	83
POWDER	86	108

- Ranks in the top 5 years of record.

Precipitation

December mountain and valley precipitation across the state was 125 percent of average and 245 percent of last year, while the water year precipitation was 117 percent of average and 145 percent of last year.

West of the Continental Divide, December mountain and valley precipitation was 134 percent of average and 280 percent of last year and the water year precipitation was 123 percent of average and 154 percent of last year. East of the Divide, December mountain and valley precipitation was 112 percent of average and 185 percent of last year and the water year precipitation was 112 percent of average and 134 percent of last year.

RIVER BASIN	DECEMBER % OF AVERAGE	WATER YEAR % OF AVERAGE
COLUMBIA	134	123
KOOTENAI	123	120
FLATHEAD	128	116
UPPER CLARK FORK	131	127
BITTERROOT	158	138
LOWER CLARK FORK	142	131
MISSOURI	118	111
JEFFERSON	122	112
MADISON	96	107
GALLATIN	84	88
MISSOURI MAINSTEM	102	115
SMITH-JUDITH-MUSSELSHELL	127	108
SUN-TETON-MARIAS	156	125
MILK	149	155
ST. MARY	154	126
YELLOWSTONE	102	113
UPPER YELLOWSTONE	112	104
LOWER YELLOWSTONE (WYOMING)	98	125
WIND	91	121
SHOSHONE	121	131
BIGHORN	92	120
TONGUE	80	93
POWDER	113	133

Reservoirs

Major reservoir storages statewide were 102 percent of average and 95 percent of last year.

Reservoir storage west of the Continental Divide was 100 percent of average and 95 percent of last year. East of the Continental Divide, reservoir storages were 102 percent of average and 92 percent of last year.

RIVER BASIN	% OF AVERAGE	% OF LAST YEAR
COLUMBIA	100	95
KOOTENAI	117	94
FLATHEAD	88	97
UPPER CLARK FORK	160	106
BITTERROOT	55	67
LOWER CLARK FORK	98	95
MISSOURI	107	95
JEFFERSON	110	99
MADISON	130	116
GALLATIN	171	102
MISSOURI MAINSTEM	100	95
SMITH-JUDITH-MUSSELSHELL	119	77
SUN-TETON-MARIAS	114	89
MILK	95	83
ST. MARY	45	37
YELLOWSTONE	103	98
UPPER YELLOWSTONE	97	97
LOWER YELLOWSTONE	103	98

Streamflow

Across Montana, streamflows are forecast to range between 90 and 117 percent of average and 167 to 134 percent of last years forecasts.

West of the Continental Divide, streamflows are forecast to range between 103 and 129 percent of average and east of the Continental Divide, streamflows are forecast to range between 87 and 118 percent of average.

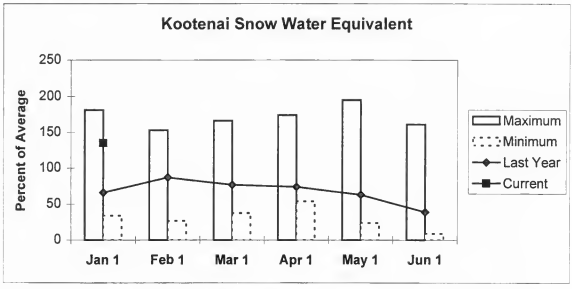
Below are the River Basin streamflow forecast summaries for the period April 1 through July 31. THESE FORECASTS ASSUME NEAR NORMAL SPRING CONDITIONS AND DO NOT ACCOUNT FOR WELL BELOW AVERAGE (70% or less) OR WELL ABOVE AVERAGE (130% or more) SNOWMELT OR SPRING RAIN. Specific forecast probabilities are available in each individual River Basin Report.

RIVER BASIN	April-July THIS YEAR % OF AVERAGE	April-July LAST YEAR % OF AVERAGE
COLUMBIA	103 to 129	58 to 84
KOOTENAI	93 to 120	52 to 73
FLATHEAD	101 to 120	61 to 79
UPPER CLARK FORK	103 to 136	55 to 91
BITTERROOT	113 to 140	66 to 95
LOWER CLARK FORK	104 to 131	55 to 84
MISSOURI	88 to 124	56 to 93
JEFFERSON	87 to 121	60 to 94
MADISON	99 to 114	70 to 86
GALLATIN	78 to 100	70 to 92
MISSOURI MAINSTEM	85 to 124	56 to 95
SMITH-JUDITH-MUSSELSHELL	80 to 122	52 to 94
SUN-TETON-MARIAS	104 to 151	57 to 105
MILK	82 to 137	27 to 83
ST. MARY	87 to 103	69 to 84
YELLOWSTONE	86 to 113	62 to 92
UPPER YELLOWSTONE	90 to 114	69 to 94
LOWER YELLOWSTONE	82 to 112	56 to 89

NOTE: The ***APRIL-JULY LAST YEAR % OF AVERAGE*** column above, is what was forecast last year, not what actually occurred.

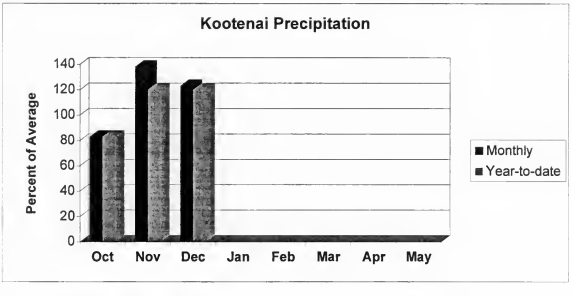
Kootenai River Basin in Montana

Snowpack conditions in the Kootenai River Basin were well above average. Snow water content was 135 percent of average and 204 percent of last year and fourth highest of record for the period 1973 through 1998.



January maximum swe was established in 1997 and minimum was in 1977; February maximum swe was in 1997 and minimum swe was in 1977; March maximum swe was in 1972 and minimum swe was in 1977; April maximum swe was in 1974 and minimum swe was in 1977; May maximum swe was in 1974 and minimum swe was in 1977; and June maximum swe was in 1974 and minimum swe was in 1992. Average is for the period 1961 through 1990.

Mountain precipitation during December was 122 percent of average and 277 percent of last year. Valley precipitation during December was 132 percent of average and 571 percent of last year. Mountain and valley water year precipitation, beginning October 1, 1998, was 120 percent of average and 169 percent of last year.



Lake Koocanusa storage was 117 percent of average and 94 percent of last year.

KOOTENAI RIVER BASIN in Montana
Streamflow Forecasts - January 1, 1999

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ====== Wetter ======>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
TOBACCO RIVER nr Eureka	APR-JUL	96	125	144	108	163	192	133
	APR-SEP	106	137	158	108	179	210	147
LIBBY RES Inflow (1,2)	APR-JUL	4008	5309	5900	102	6491	7792	5779
	APR-SEP	4690	6217	6910	102	7603	9130	6772
FISHER RIVER nr Libby	APR-JUL	118	183	227	97	271	336	234
	APR-SEP	130	197	243	97	289	356	250
YAAK RIVER nr Troy	APR-JUL	422	515	578	120	641	734	483
	APR-SEP	446	541	605	120	669	764	505
KOOTENAI at Leonia (1,2)	APR-JUL	5093	6721	7460	104	8199	9827	7199
	APR-SEP	5858	7730	8580	104	9430	11302	8275

KOOTENAI RIVER BASIN in Montana
Reservoir Storage (1000 AF) - End of December

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
LAKE KOOCANUSA	5748.0	3554.0	3774.0	3050.0

KOOTENAI RIVER BASIN in Montana
Watershed Snowpack Analysis - January 1, 1999

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
KOOTENAY in CANADA	4	202	132
KOOTENAI MAINTSTEM	2	251	173
TOBACCO	3	169	114
FISHER	1	168	113
YAAK	2	207	124
KOOTENAI in MONTANA	8	204	135
KOOTENAI ab BONNERS FERRY	12	203	135

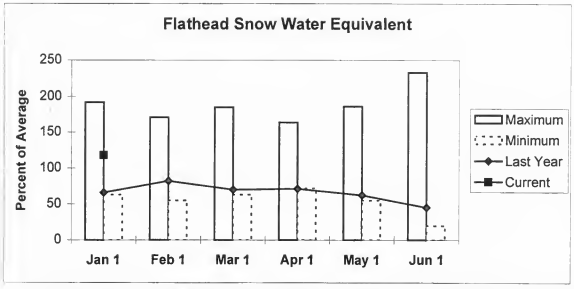
* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural volume - actual volume may be affected by upstream water management.

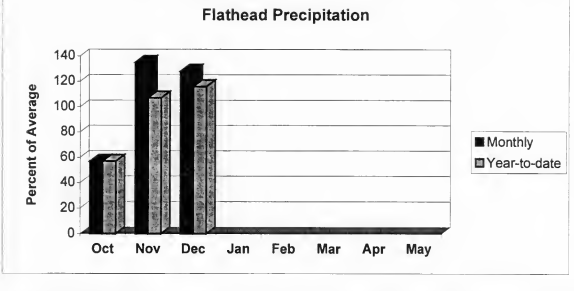
Flathead River Basin

Snowpack conditions in the Flathead River Basin were above average. Snow water content was 118 percent of average and 178 percent of last year.



January maximum swe was established in 1997 and minimum was in 1988; February maximum swe was in 1972 and minimum was in 1977; March maximum swe was in 1972 and minimum was in 1977; April maximum swe was in 1972 and minimum was in 1992; May maximum swe was in 1972 and minimum was in 1992; and June maximum swe was in 1974 and minimum was in 1992. Average is for the period 1961 through 1990.

Mountain precipitation during December was 130 percent of average and 241 percent of last year. Valley precipitation during December was 92 percent of average and 316 percent of last year. Mountain and valley water year precipitation, beginning October 1, 1998, was 116 percent of average and 148 percent of last year.



Combined Camas reservoir storage was 176 percent of average and 101 percent of last year; combined Mission Valley reservoir storage was 75 percent of average and 73 percent of last year; Hungry Horse storage was at 101 percent of average and 101 percent of last year; and Flathead Lake storage was 61 percent of average and 86 percent of last year.

FLATHEAD RIVER BASIN
Streamflow Forecasts - January 1, 1999

Forecast Point	Forecast Period	<<====== Drier ====== Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	Future Conditions 50% (Most Probable) (1000AF)	(% AVG.)	====== Wetter ======>> 30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
NF FLATHEAD nr Columbia Falls	APR-JUL	1457	1655	1790	108	1925	2123	1662
	APR-SEP	1610	1824	1970	107	2116	2330	1836
MF FLATHEAD nr West Glacier	APR-JUL	1477	1669	1800	110	1931	2123	1638
	APR-SEP	1621	1823	1960	110	2097	2299	1788
HUNGRY HORSE Reservoir Inflow (1,2)	APR-JUL	1561	1994	2190	107	2386	2819	2051
	APR-SEP	1696	2132	2330	107	2528	2964	2184
FLATHEAD at Columbia Falls (1,2)	APR-JUL	4654	5396	5900	108	6404	7146	5482
	APR-SEP	5104	5888	6420	108	6952	7736	5960
STILLWATER nr Whitefish	APR-JUL	167	206	232	123	258	297	189
	APR-SEP	184	226	255	122	284	326	209
WHITEFISH nr Kalispell	APR-JUL	88	103	113	109	123	138	104
	APR-SEP	96	113	125	108	137	154	116
SWAN RIVER nr Bigfork	APR-JUL	511	594	650	112	706	789	583
	APR-SEP	588	678	740	111	802	892	665
FLATHEAD Lake Inflow (1,2)	APR-JUL	5382	6501	7010	110	7519	8638	6390
	APR-SEP	5938	7081	7600	110	8119	9262	6926

FLATHEAD RIVER BASIN
Reservoir Storage (1000 AF) - End of December

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
CAMAS (4)	45.2	32.8	32.6	18.6
MISSION VALLEY (8)	100.0	25.2	34.3	33.8
HUNGRY HORSE	3451.0	2604.0	2579.0	2586.0
FLATHEAD LAKE	1791.0	800.5	925.5	1305.0

FLATHEAD RIVER BASIN
Watershed Snowpack Analysis - January 1, 1999

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
NF FLATHEAD in CANADA	0	0	0
NF FLATHEAD in MONTANA	6	194	122
MIDDLE FORK FLATHEAD	5	211	141
SOUTH FORK FLATHEAD	5	154	100
STILLWATER-WHITEFISH	4	210	112
SWAN	6	142	99
MISSION VALLEY	3	158	100
LITTLE BITTERROOT-ASHLEY	4	215	112
JOCKO	4	170	133
FLATHEAD in MONTANA	26	178	118
FLATHEAD RIVER BASIN	26	178	118

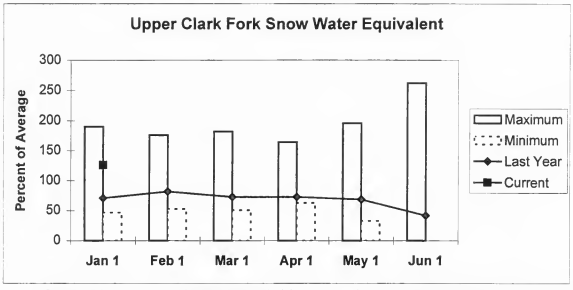
* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural volume - actual volume may be affected by upstream water management.

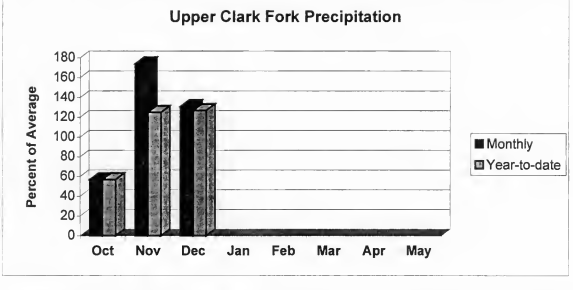
Upper Clark Fork River Basin

Snowpack conditions in the Upper Clark Fork River Basin were above average. Snow water content was 126 percent of average and 177 percent of last year and the eighth highest year for the period 1961 through 1998.



January maximum swe was established in 1997 and minimum swe was in 1977; February maximum was in 1972 and minimum swe was in 1977; March maximum swe was in 1972 and minimum swe was in 1977; April maximum swe was in 1972 and minimum was in 1994; May maximum swe was in 1972 and minimum swe was in 1977; and June maximum swe was in 1975 and minimum swe was in 1987. Average is for the period 1961 through 1990.

Mountain precipitation during December was 134 percent of average and 303 percent of last year. Valley precipitation during December was 107 percent of average and 589 percent of last year. Mountain and valley water year precipitation, beginning October 1, 1998, was 127 percent of average and 150 percent of last year.



Lower Willow Creek storage was 150 percent of average and 131 percent of last year; and Nevada Creek storage was 164 percent of average and 100 percent of last year.

UPPER CLARK FORK RIVER BASIN
Streamflow Forecasts - January 1, 1999

Forecast Point	Forecast Period	<<====== Drier ====== Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	Future Conditions 50% (Most Probable) (1000AF)	(% AVG.)	====== Wetter ======>> 30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
WARM SPRINGS CK at Anaconda	APR-JUL	23	32	39	103	46	56	38
	APR-SEP	29	40	48	102	56	67	47
LITTLE BLACKFOOT nr Garrison	APR-JUL	49	74	92	111	110	135	83
	APR-SEP	55	82	100	112	118	146	89
FLINT CREEK nr Southern Cross	APR-JUL	10.4	14.5	17.3	122	20	24	14.2
	APR-SEP	12.0	17.1	21	123	24	29	16.7
FLINT CREEK blw Boulder Ck	APR-JUL	43	58	68	119	78	93	57
	APR-SEP	55	73	85	116	97	115	73
LOWER WILLOW CK RES Inflow	APR-JUL	9.5	13.5	16.3	116	19.1	23	14.0
	APR-SEP	10.4	14.6	17.4	118	20	24	14.8
MF ROCK CREEK nr Philipsburg	APR-JUL	62	75	84	127	93	106	66
	APR-SEP	69	83	93	126	103	117	74
ROCK CREEK nr Clinton	APR-JUL	295	352	390	132	428	485	296
	APR-SEP	327	388	430	129	472	533	333
NEVADA CREEK nr Finn	APR-JUL	13.7	19.2	23	120	27	32	19.1
	APR-SEP	15.1	21	25	118	29	35	21
CLEARWATER nr Clearwater	APR-JUL	140	170	190	111	210	240	172
	APR-SEP	148	179	200	111	221	252	181
BLACKFOOT RIVER nr Bonner	APR-JUL	780	935	1040	125	1145	1300	835
	APR-SEP	875	1039	1150	124	1261	1425	926
CLARK FORK abv Milltown	APR-JUL	536	702	815	125	928	1094	652
	APR-SEP	636	820	945	125	1070	1254	755
CLARK FORK abv Missoula	APR-JUL	1319	1635	1850	124	2065	2381	1487
	APR-SEP	1524	1867	2100	125	2333	2676	1681

UPPER CLARK FORK RIVER BASIN
Reservoir Storage (1000 AF) - End of December

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
GEORGETOWN LAKE		NO REPORT		
LOWER WILLOW CREEK	4.9	2.1	1.6	1.4
NEVADA CREEK	12.6	6.4	6.4	3.9

UPPER CLARK FORK RIVER BASIN
Watershed Snowpack Analysis - January 1, 1999

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
CLARK FORK ab FLINT CREEK	10	165	122
FLINT CREEK	5	156	120
ROCK CREEK	3	151	135
CLARK FORK ab BLACKFOOT	15	169	126
BLACKFOOT	15	199	130
UPPER CLARK FORK BASIN	27	178	126

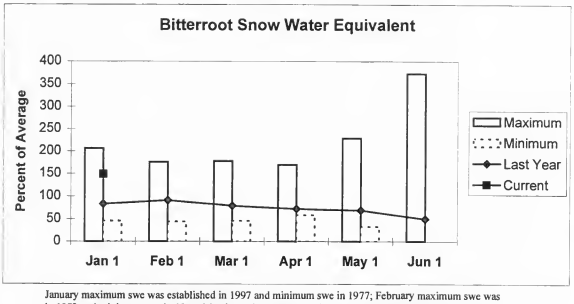
* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural volume - actual volume may be affected by upstream water management.

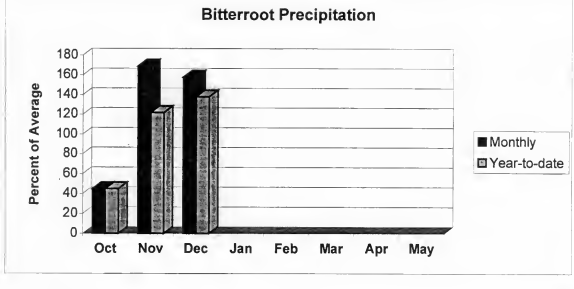
Bitterroot River Basin

Snowpack conditions in the Bitterroot River Basin were well above average. Snow water content was 149 percent of average and 182 percent of last year and third highest for the period 1961 through 1998.



January maximum swe was established in 1997 and minimum swe in 1977; February maximum swe was in 1972 and minimum was in 1977; March maximum swe was in 1972 and minimum swe was in 1977; April maximum swe was in 1972 and minimum swe was in 1977; May maximum swe was in 1972 and minimum swe was in 1987; and June maximum swe was 1972 and 1974 and minimum swe was in 1987 and 1992. Average is for the period 1961 through 1990.

Mountain precipitation during December was 157 percent of average and 272 percent of last year. Valley precipitation during December was 166 percent of average and 492 percent of last year. Mountain and valley water year precipitation, beginning October 1, 1998, was 138 percent of average and 141 percent of last year.



Painted Rocks Lake storage was 54 percent of average and 188 percent of last year and Como storage was 56 percent of average and 34 percent of last year.

BITTERROOT RIVER BASIN
Streamflow Forecasts - January 1, 1999

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ====== Wetter ======>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
WF BITTERROOT nr Conner (2)	APR-JUL	138	175	200	132	225	262	152
	APR-SEP	155	194	220	133	246	285	166
BITTERROOT nr Darby	APR-JUL	439	544	615	125	686	791	491
	APR-SEP	496	602	675	125	748	854	540
COMO RESERVOIR Inflow	APR-JUL	76	87	95	120	103	114	79
	APR-SEP	81	92	100	121	108	119	83
SKALKAHO CK nr Hamilton	APR-JUL	43	53	59	128	65	75	46
	APR-SEP	50	60	67	126	74	84	53
BITTERROOT at Missoula	APR-JUL	1184	1443	1620	125	1797	2056	1300
	APR-SEP	1330	1586	1760	124	1934	2190	1420

BITTERROOT RIVER BASIN
Reservoir Storage (1000 AF) - End of December

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
PAINTED ROCKS LAKE	31.7	7.5	4.0	13.9
COMO	34.9	5.0	14.7	9.0

BITTERROOT RIVER BASIN
Watershed Snowpack Analysis - January 1, 1999

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
WEST FORK BITTERROOT	2	155	134
EAST SIDE BITTERROOT	3	171	139
WEST SIDE BITTERROOT	3	195	157
BITTERROOT RIVER BASIN	7	182	149

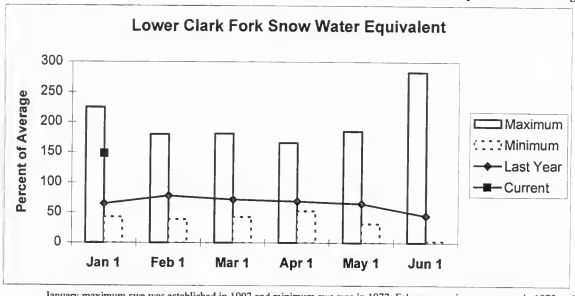
* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural volume - actual volume may be affected by upstream water management.

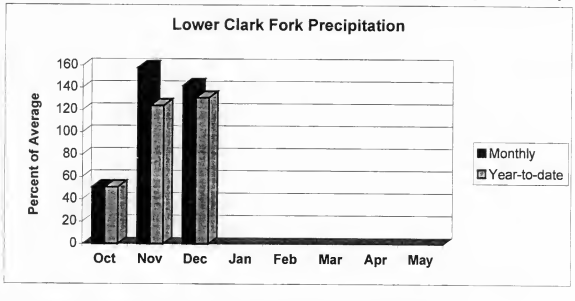
Lower Clark Fork River Basin

Snowpack conditions in the Lower Clark Fork River Basin were well above average. Snow water content was 148 percent of average and 223 percent of last year and fifth highest of record for the period 1967 through 1998.



January maximum swe was established in 1997 and minimum swe was in 1977; February maximum swe was in 1972 and minimum swe was in 1977; March maximum swe was in 1972 and minimum was in 1977; April maximum swe was in 1972 and minimum swe was in 1981; May maximum swe was in 1972 and minimum swe was in 1977; and June maximum swe was in 1974 and minimum swe was in 1977. Average is for the period 1961 through 1990.

Mountain precipitation during December was 140 percent of average and 266 percent of last year. Valley precipitation during December was 154 percent of average and 358 percent of last year. Mountain and valley water year precipitation, beginning October 1, 1998, was 131 percent of average and 164 percent of last year.



Noxon Rapids storage was 98 percent of average and 95 percent of last year.

LOWER CLARK FORK RIVER BASIN
Streamflow Forecasts - January 1, 1999

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ====== Wetter ======>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
CLARK FORK abv Missoula	APR-JUL	1319	1635	1850	124	2065	2381	1487
	APR-SEP	1524	1867	2100	125	2333	2676	1681
CLARK FORK blw Missoula	APR-JUL	2527	3088	3470	125	3852	4413	2788
	APR-SEP	2886	3466	3860	125	4254	4834	3099
CLARK FORK at St. Regis (1)	APR-JUL	2694	3963	4540	123	5117	6386	3686
	APR-SEP	2990	4400	5040	123	5680	7090	4095
CLARK FORK nr Plains (1,2)	APR-JUL	7429	10435	11800	113	13165	16171	10450
	APR-SEP	8194	11499	13000	113	14501	17806	11470
THOMPSON nr Thompson Falls	APR-JUL	189	234	265	124	296	341	214
	APR-SEP	214	262	295	123	328	376	240
PROSPECT CREEK at Thompson Falls	APR-JUL	90	111	125	102	139	160	123
	APR-SEP	99	120	135	102	150	171	132
CLARK FK at Whitehorse Rpds (1,2)	APR-JUL	8169	11560	13100	112	14640	18031	11730
	APR-SEP	8973	12705	14400	112	16095	19827	12910

LOWER CLARK FORK RIVER BASIN
Reservoir Storage (1000 AF) - End of December

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
NOXON RAPIDS	335.0	312.1	327.4	317.1

LOWER CLARK FORK RIVER BASIN
Watershed Snowpack Analysis - January 1, 1999

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
LOWER CLARK FORK BASIN	7	223	148

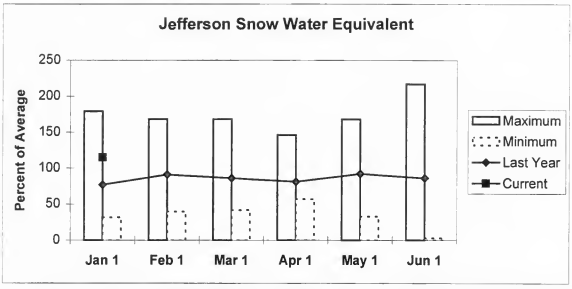
* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural volume - actual volume may be affected by upstream water management.

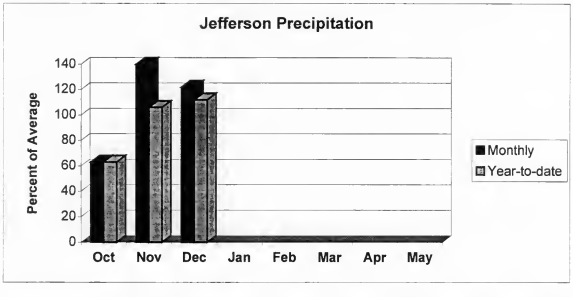
Jefferson River Basin

Snowpack conditions in the Jefferson River Basin were above average. Snow water content was 115 percent of average and 153 percent of last year.



January maximum swe was established in 1997 and minimum swe was in 1977; February maximum swe was in 1997 and minimum was in 1977; March maximum swe was in 1972 and minimum was in 1977; April maximum swe was in 1972 and minimum was in 1977; May maximum swe was in 1975 and minimum swe was in 1977; and June maximum swe was in 1982 and minimum in 1987. Average is for the period 1961 through 1990.

Mountain precipitation during December was 118 percent of average and 253 percent of last year. Valley precipitation during December was 180 percent of average and 214 percent of last year. Mountain and valley water year precipitation, beginning October 1, 1998, was 112 percent of average and 130 percent of last year.



Lima storage was 140 percent of average and 112 percent of last year; Clark Canyon storage was 104 percent of average and 97 percent of last year; and Ruby River storage was 106 percent of average and 88 percent of last year.

JEFFERSON RIVER BASIN
Streamflow Forecasts - January 1, 1999

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ====== Wetter ======>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
RED ROCK RIVER near Monida (2)	APR-JUL	56	76	89	92	102	121	97
	APR-SEP	57	80	96	91	112	135	105
BEAVERHEAD RIVER near Grant (2)	APR-JUL	95	126	147	111	168	199	132
	APR-SEP	117	155	180	116	205	243	155
BEAVERHEAD RIVER at Barretts (2)	APR-JUL	127	160	182	106	204	237	172
	APR-SEP	164	199	223	110	247	282	203
RUBY RIVER near Alder	APR-JUL	57	75	88	106	101	120	83
	APR-SEP	69	91	106	107	121	142	99
BIG HOLE RIVER near Melrose	APR-JUL	396	541	640	100	739	884	641
	APR-SEP	434	590	695	100	800	956	697
BOULDER RIVER near Boulder	APR-JUL	57	80	95	112	111	134	85
	APR-SEP	61	86	103	113	120	145	91
WILLOW CREEK near Harrison	APR-JUL	7.6	14.8	19.7	111	25	32	17.7
	APR-SEP	8.1	16.5	22	111	28	36	20
JEFFERSON RIVER near Three Forks (2)	APR-JUL	506	742	902	92	1062	1298	985
	APR-SEP	581	833	1005	99	1177	1429	1012

JEFFERSON RIVER BASIN
Reservoir Storage (1000 AF) - End of December

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
LIMA	84.0	45.5	40.5	32.4
CLARK CANYON	255.6	147.7	152.9	142.1
RUBY RIVER	38.8	21.4	24.2	20.2

JEFFERSON RIVER BASIN
Watershed Snowpack Analysis - January 1, 1999

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
BEAVERHEAD	8	161	117
RUBY	5	141	94
BIGHOLE	9	148	121
BOULDER	5	148	120
JEFFERSON RIVER BASIN	22	153	115

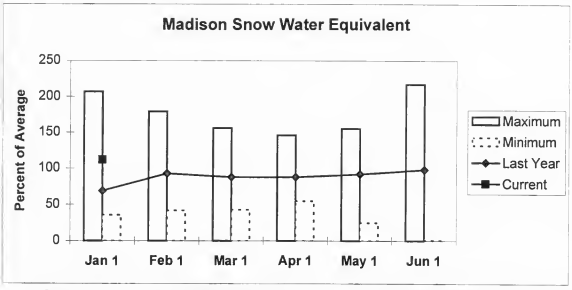
* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural volume - actual volume may be affected by upstream water management.

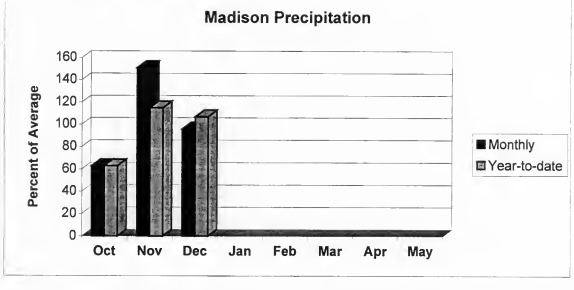
Madison River Basin

Snowpack conditions in the Madison River Basin were above average. Snow water content was 112 percent of average and 166 percent of last year.



January maximum swe was established in 1997 and minimum swe was in 1977; February maximum swe was in 1997 and minimum was in 1977; March maximum swe was in 1997 and minimum was in 1977; April maximum swe was in 1997 and minimum was in 1977; May maximum swe was in 1997 and minimum swe was in 1977; and June maximum swe was in 1995 and minimum in 1987. Average is for the period 1961 through 1990.

Mountain and valley precipitation during December was 95 percent of average and 197 percent of last year. Mountain and valley water year precipitation, beginning October 1, 1998, was 107 percent of average and 138 percent of last year.



Ennis Lake storage was 100 percent of average and 112 percent of last year and Hebgen Lake storage was 134 percent of average and 116 percent of last year.

MADISON RIVER BASIN
Streamflow Forecasts - January 1, 1999

Forecast Point	Forecast Period	<<= Drier = Future Conditions = Wetter =>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
MADISON RIVER near Grayling (2)	APR-JUL	338	383	413	109	443	488	380
	APR-SEP	439	491	527	108	563	615	486
MADISON RIVER near McAllister (2)	APR-JUL	564	640	692	105	744	820	662
	APR-SEP	727	812	869	105	926	1011	831

MADISON RIVER BASIN
Reservoir Storage (1000 AF) - End of December

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
ENNIS LAKE	41.0	33.6	29.9	33.7
HEBGEN LAKE	377.5	331.5	286.1	246.8

MADISON RIVER BASIN
Watershed Snowpack Analysis - January 1, 1999

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
MADISON abv HEBGEN LAKE	6	206	128
MADISON blw HEBGEN LAKE	8	140	100
MADISON RIVER BASIN	14	166	112

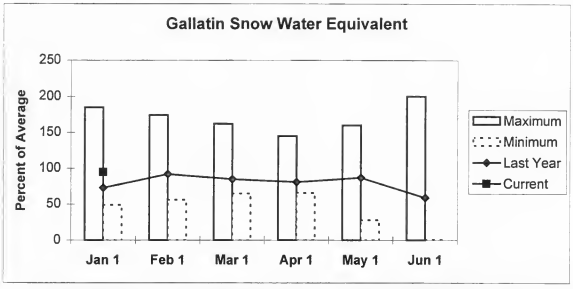
* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural volume - actual volume may be affected by upstream water management.

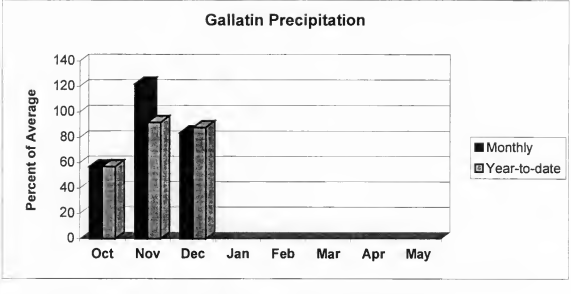
Gallatin River Basin

Snowpack conditions in the Gallatin River Basin were near average. Snow water content was 95 percent of average and 128 percent of last year.



January maximum swe was established in 1997 and minimum swe was in 1966; February maximum swe was in 1997 and minimum was in 1981; March maximum swe was in 1997 and minimum was in 1977 and 1987; April maximum swe was in 1997 and minimum was in 1987; May maximum swe was in 1970 and minimum swe was in 1987; and June maximum swe was in 1975 and minimum in 1987. Average is for the period 1961 through 1990.

Mountain precipitation during December was 81 percent of average and 151 percent of last year. Valley precipitation during December was 122 percent of average and 170 percent of last year. Mountain and valley water year precipitation, beginning October 1, 1998, was 88 percent of average and 119 percent of last year.



Middle Creek storage was 171 percent of average and 102 percent of last year.

GALLATIN RIVER BASIN
Streamflow Forecasts - January 1, 1999

Forecast Point	Forecast Period	<<====== Drier ====== Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	Future Conditions 50% (Most Probable) (1000AF)	(% AVG.)	====== Wetter ======>> 30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
GALLATIN RIVER near Gateway	APR-JUL	316	374	413	94	452	510	441
	APR-SEP	377	441	484	93	527	591	518
E & W FK HYALITE CREEK near Bozeman	APR-JUL	13.9	17.5	20	87	23	26	23
	APR-SEP	16.0	19.9	23	87	25	29	26
HYALITE CREEK nr Bozeman (2)	APR-JUL	20	26	31	85	35	41	36
	APR-SEP	24	31	35	84	40	46	42
GALLATIN RIVER at Logan (2)	APR-JUL	281	382	450	90	518	619	498
	APR-SEP	343	448	520	90	592	697	581

GALLATIN RIVER BASIN
Reservoir Storage (1000 AF) - End of December

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
MIDDLE CREEK	10.2	5.8	5.7	3.4

GALLATIN RIVER BASIN
Watershed Snowpack Analysis - January 1, 1999

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
UPPER GALLATIN	4	152	112
HYALITE	2	89	73
BRIDGER	2	118	76
GALLATIN RIVER BASIN	8	128	95

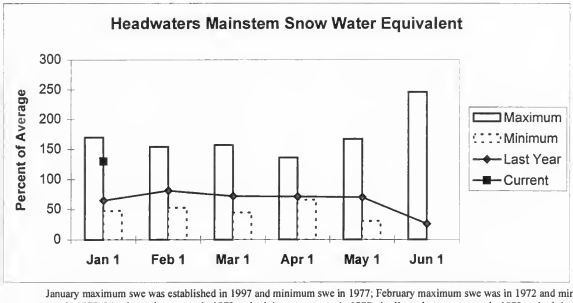
* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural volume - actual volume may be affected by upstream water management.

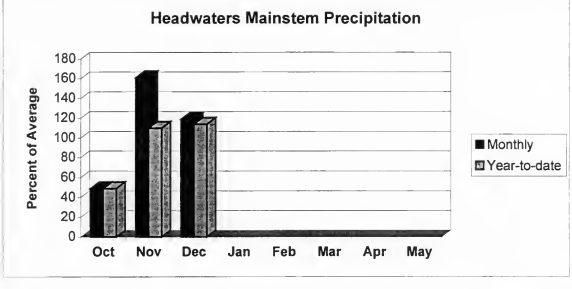
Missouri Mainstem River Basin

Snowpack conditions for the Missouri Mainstem are well above average. Snow water content is 135 percent of average and 214 percent of last year. Snowpack in the Headwaters Missouri Mainstem River Basin were well above average. Snow water content was 130 percent of average, 193 percent of last year, and third highest of record for the period 1961 through 1998.



January maximum swe was established in 1997 and minimum swe in 1977; February maximum swe was in 1972 and minimum swe was in 1977; March maximum swe in 1972 and minimum swe was in 1977; April maximum swe was in 1972 and minimum swe was in 1961; May maximum swe was in 1975 and minimum swe was in 1977; and June maximum swe was in 1982 and minimum swe was in 1992. Average is for the period 1961 through 1990.

Mountain precipitation during December was 119 percent of average and 300 percent of last year. Valley precipitation during December was 56 percent of average and 271 percent of last year. Mountain and valley water year precipitation, beginning October 1, 1998, was 115 percent of average and 140 percent of last year.



Canyon Ferry Lake storage was 100 percent of average and 95 percent of last year; Helena Valley storage was 94 percent of average and 102 percent of last year; Lake Helena storage was 107 percent of average and 102 percent of last year; Hauser & Helena storage was 103 percent of average and 101 percent of last year; Holter Lake storage was 106 percent of average and 100 percent of last year; and Fort Peck Lake storage was 103 percent of average and 101 percent of last year.

MISSOURI MAINSTEM RIVER BASIN
Streamflow Forecasts - January 1, 1999

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ====== Wetter ======>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
MISSOURI RIVER at Toston (2)	APR-JUL	1287	1753	2070	100	2387	2853	2075
	APR-SEP	1667	2087	2420	100	2753	3165	2416
PRICKLY PEAR CREEK near Clancy	APR-JUL	1.9	12.9	20	89	28	39	23
	APR-SEP	3.3	15.6	24	89	32	45	27
SUN RIVER at Gibson Dam (2)	APR-JUL	437	548	624	131	700	811	478
	APR-SEP	490	607	686	130	765	882	526
MISSOURI RIVER at Fort Benton (2)	APR-JUL	2006	2771	3290	107	3809	4574	3087
	APR-SEP	2575	3430	3980	108	4530	5407	3678
MARIAS RIVER near Shelby (2)	APR-JUL	333	490	596	133	702	859	447
	APR-SEP	448	530	638	131	746	1125	487
MISSOURI RIVER at Virgelle (2)	APR-JUL	2195	3246	3960	110	4674	5725	3595
	APR-SEP	3036	4034	4740	112	5446	6832	4217
MISSOURI RIVER near Landusky (2)	APR-JUL	2920	3742	4300	110	4858	5680	3897
	APR-SEP	3343	4550	5280	115	6010	7649	4580
MISSOURI RIVER below Fort Peck (2)	APR-JUL	2674	3761	4500	112	5239	6326	4015
	APR-SEP	3127	4289	5230	117	6171	7505	4467
LAKE SAKAKAWEA Inflow (2)	APR-JUL	8075	9995	11300	114	12605	14525	9897
	APR-SEP	8736	11410	13000	115	14590	17586	11346

MISSOURI MAINSTEM RIVER BASIN
Reservoir Storage (1000 AF) - End of December

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
CANYON FERRY LAKE	2043.0	1684.0	1780.0	1690.0
HELENA VALLEY	9.2	4.8	4.7	5.1
LAKE HELENA	10.4	11.1	10.9	10.4
HAUSER & HELENA	61.9	63.6	63.1	61.7
HOLTER LAKE	81.9	81.2	81.1	76.7
FORT PECK LAKE (MAF)	18.9	15.5	15.4	15.1

MISSOURI MAINSTEM RIVER BASIN
Watershed Snowpack Analysis - January 1, 1999

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
HEADWATERS MAINSTEM	9	193	130
SMITH-JUDITH-MUSSELSHELL	8	176	111
SUN-TETON-MARIAS	7	227	150
MAINSTEM ab FT PECK RES	23	201	132
MILK RIVER BASIN	5	566	194
MISSOURI MAINSTEM BASIN	27	214	135

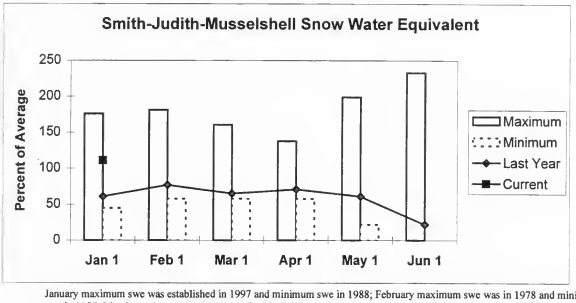
* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural volume - actual volume may be affected by upstream water management.

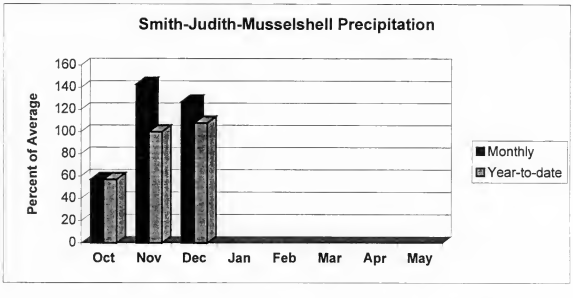
Smith-Judith-Musselshell River Basins

Snowpack conditions in the Smith-Judith-Musselshell River Basins were above average. Snow water content was 111 percent of average and 176 percent of last year. Snow water content in the Smith River Basin was 123 percent of average and 193 percent of last year; in the Judith River Basin was 107 percent of average and 160 percent of last year; and in the Musselshell Basin River was 94 percent of average and 172 percent of last year.



January maximum swe was established in 1997 and minimum swe in 1988; February maximum swe was in 1978 and minimum swe was in 1987; March maximum swe was in 1978 and minimum swe was in 1987; April maximum swe was in 1970 and minimum swe was in 1992; and May maximum swe was in 1970 and minimum swe was in 1987; and June maximum swe was in 1982 and minimum swe was in 1992. Average is for the period 1961 through 1990.

Mountain and valley precipitation during December in the Smith-Belts was 133 percent of average and 291 percent of last year; in the Judith was 127 percent of average and 173 percent of last year; and in the Musselshell was 135 percent of average and 271 percent of last year. Mountain and valley water year precipitation, beginning October 1, 1998, was 108 percent of average and 158 percent of last year.



Smith River storage was 115 percent of average and 84 percent of last year; Newlan Creek storage was 102 percent of average; Bair storage was 76 percent of average and 72 percent of last year; Martinsdale storage was 115 percent of average and 62 percent of last year; and Deadman's Basin was 125 percent of average and 80 percent of last year.

SMITH-JUDITH-MUSSELSHELL RIVER BASINS
Streamflow Forecasts - January 1, 1999

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ====== Wetter ======>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
SHEEP CREEK nr White Sulphur Springs	APR-JUL	14.1	17.1	19.1	106	21	24	18.1
	APR-SEP	16.7	19.9	22	105	24	28	21
SMITH RIVER blw Eagle Creek	APR-JUL	37	65	85	83	105	133	103
	APR-SEP	49	82	105	85	128	161	124
NF MUSSELSHELL near Delpine	APR-JUL	2.98	4.69	5.85	122	7.01	8.72	4.80
	APR-SEP	3.65	5.56	6.86	123	8.16	10.07	5.60
SF MUSSELSHELL abv Martinsdale	APR-JUL	13.1	35	50	96	65	87	52
	APR-SEP	14.9	38	53	95	69	91	56

SMITH-JUDITH-MUSSELSHELL RIVER BASINS
Reservoir Storage (1000 AF) - End of December

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
SMITH RIVER	10.6	6.8	8.1	5.9
NEWLAN CREEK	12.4	9.1	---	8.9
BAIR	7.0	2.8	3.9	3.7
MARTINSDALE	23.1	10.6	17.0	9.2
DEADMAN'S BASIN	72.2	50.3	62.8	40.3

SMITH-JUDITH-MUSSELSHELL RIVER BASINS
Watershed Snowpack Analysis - January 1, 1999

Watershed	Number of Data Sites	This Year as a % of Last Yr	Average
SMITH	4	193	123
JUDITH	4	160	107
MUSSELSHELL	3	172	94
SMITH-JUDITH-MUSSELSHELL	8	176	111

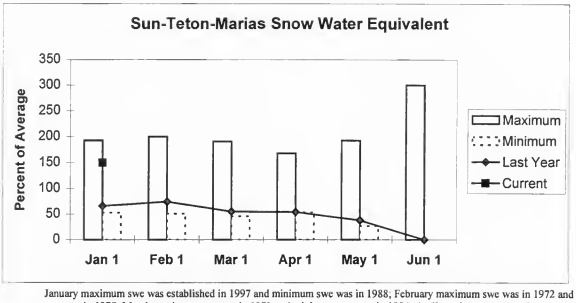
* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural volume - actual volume may be affected by upstream water management.

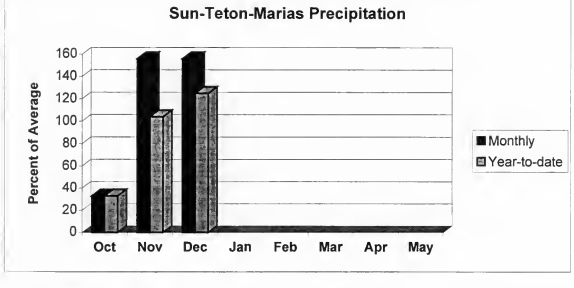
Sun-Teton-Marias River Basins

The combined snowpack conditions for the Sun-Teton-Marias River Basins were well above average. Snow water content was 150 percent of average, 227 percent of last year,and seventh highest of record for the period 1969 through 1998. These basins have made a complete turn around from last year. Hopefully the weather patterns will remain favorable through the remaining winter months. Snow water content in the Sun River Basin was 161 percent of average and 226 percent of last year; in the Teton River Basin was 151 percent of average and 223 percent of last year; and in the Marias River Basin was 144 percent of average and 228 percent of last year.



January maximum swe was established in 1997 and minimum swe was in 1988; February maximum swe was in 1972 and minimum swe was in 1977; March maximum swe was in 1972 and minimum swe was in 1984; April maximum swe was in 1972 and minimum swe was in 1984; May maximum swe was in 1972 and minimum swe was in 1977; and June maximum was in 1982 and minimum swe was in 1992. Average is for the period 1961 through 1990.

Mountain and valley precipitation during December in the Sun was 154 percent of average and 573 percent of last year; in the Teton was 165 percent of average and 371 percent of last year; and in the Marias was 153 percent of average and 287 percent of last year. Mountain and valley water year precipitation, beginning October 1, 1998, was 125 percent of average and 160 percent of last year.



Gibson storage was 73 percent of average and 67 percent of last year; Pishkun storage was 111 percent of average and 101 percent of last year; Willow Creek storage was 135 percent of average and 93 percent of last year; Lower Two Medicine Lake storage was 0 percent of average and 0 percent of last year; Four Horns Lake storage was 75 percent of average and 85 percent of last year; Swift storage was 104 percent of average and 17 percent of last year; Lake Frances storage was 68 percent of average and 64 percent of last year; and Lake Elwell (Tiber) storage was 124 percent of average and 93 percent of last year.

SUN-TETON-MARIAS RIVER BASINS
Streamflow Forecasts - January 1, 1999

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ====== Wetter ======>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
SUN RIVER at Gibson Dam (2)	APR-JUL	437	548	624	131	700	811	478
	APR-SEP	490	607	686	130	765	882	526
TWO MEDICINE RIVER near Browning (2)	APR-JUL	182	241	281	131	321	380	215
	APR-SEP	199	258	298	131	338	397	228
BADGER CREEK near Browning (2)	APR-JUL	83	111	129	124	147	175	104
	APR-SEP	100	129	149	124	169	198	120
SWIFT RESERVOIR Inflow near Dupuyer	APR-JUL	46	68	83	122	98	120	68
	APR-SEP	59	82	97	122	113	135	80
DUPUYER CREEK near Valier	APR-JUL	1.4	12.4	19.9	128	27	38	15.5
	APR-SEP	2.9	14.6	23	129	30	42	17.4
CUT BANK CREEK at Cut Bank	APR-JUL	64	90	108	124	126	152	87
	APR-SEP	74	101	119	124	138	165	96
MARIAS RIVER near Shelby (2)	APR-JUL	333	490	596	133	702	859	447
	APR-SEP	448	530	638	131	746	1125	487

SUN-TETON-MARIAS RIVER BASINS
Reservoir Storage (1000 AF) - End of December

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
GIBSON	99.1	30.0	45.1	41.0
PISHKUN	32.0	19.9	19.7	17.9
WILLOW CREEK	32.2	28.0	30.0	20.8
LOWER TWO MEDICINE LAKE	11.9	0.0	11.9	6.5
FOUR HORNS LAKE	19.2	9.3	10.9	12.4
SWIFT	30.0	14.4	15.3	13.8
LAKE FRANCES	112.0	47.6	74.0	69.6
LAKE ELWELL (TIBER)	1347.0	734.0	789.0	590.6

SUN-TETON-MARIAS RIVER BASINS
Watershed Snowpack Analysis - January 1, 1999

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
SUN	2	226	161
TETON	3	223	151
MARIAS	4	228	144
SUN-TETON-MARIAS	7	227	150

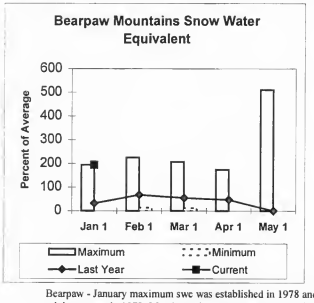
* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

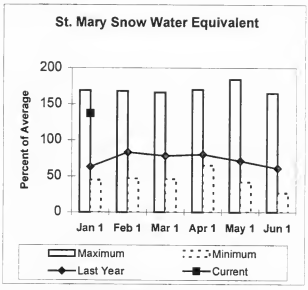
The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural volume - actual volume may be affected by upstream water management.

St. Mary and Milk River Basins

Snowpack conditions in the St. Mary and Milk River Basins were well above average. Snow water content in the Saint Mary River Basin was 137 percent of average, 219 percent of last year, and seventh highest of record for the period 1961 through 1998. The Milk River Basin (Bearpaw Mountains) was 194 percent of average, 566 percent of last year, and tied for the highest of record for the period 1973 through 1998.

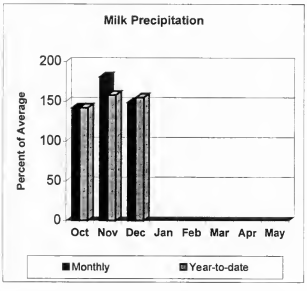


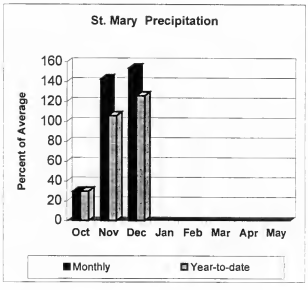


Bearpaw - January maximum swe was established in 1978 and minimum swe was in 1981; February maximum swe was 1978 and minimum was in 1973; March maximum swe was 1978 and minimum swe was 1981; April maximum swe was in 1975 and minimum swe was in 1983; May maximum swe was 1975 and the minimum has occurred in several years. Average is for the period 1961 through 1990.

St. Mary - January maximum swe was established in 1997 and minimum swe was in 1988; February maximum swe was in 1972 and minimum swe was in 1977; March maximum swe was in 1972 and minimum swe was in 1977; April maximum swe was in 1972 and minimum swe was in 1992; May maximum swe was in 19972 and minimum swe was in 1977; and June maximum swe was in 1991 and minimum swe was 1992. Average is for the period 1961 through 1990.

Mountain and valley precipitation in the St. Mary River Basin during December was 154 percent of average and 260 percent of last year; and in the Milk River Basin during December was 149 percent of average and 252 percent of last year. Mountain and valley water year precipitation, beginning October 1, 1998, was 137 percent of average and 183 percent of last year.





Lake Sherburne storage was 45 percent of average and 37 percent of last year; Fresno storage was 91 percent of average and 92 percent of last year; Beaver Creek storage was 150 percent of average and 117 percent of last year; and Nelson storage was 99 percent of average and 72 percent of last year.

ST. MARY and MILK RIVER BASINS
Streamflow Forecasts - January 1, 1999

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ====== Wetter ======>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
SWIFTCURRENT CREEK at Sherburne (2)	APR-JUL	80	94	103	96	112	126	107
	APR-SEP	99	113	123	98	133	147	125
ST. MARY RIVER near Babb	APR-JUL	324	361	386	98	411	448	395
	APR-SEP	386	429	458	99	487	530	463
ST. MARY RIVER at US/CAN Border (2)	APR-JUL	320	379	419	91	459	518	462
	APR-SEP	418	483	528	98	573	638	539
MILK RIVER at Western Crossing	MAR-JUL	23	34	42	96	50	61	44
	MAR-SEP	29	36	44	96	52	85	46
MILK RIVER at Eastern Crossing (2)	MAR-JUL	20	54	76	95	99	132	80
	MAR-SEP	57	60	84	96	108	141	88
BEAVER CREEK near Havre	MAR-JUL	4.5	10.3	14.2	138	18.1	24	10.3

ST. MARY and MILK RIVER BASINS
Reservoir Storage (1000 AF) - End of December

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
LAKE SHERBURNE	64.3	9.4	25.6	21.1
FRESNO	127.0	48.2	52.6	53.1
BEAVER CREEK	3.5	2.7	2.3	1.8
NELSON	66.8	37.7	52.1	38.0

ST. MARY and MILK RIVER BASINS
Watershed Snowpack Analysis - January 1, 1999

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
ST. MARY	2	219	137
BEARPAW MOUNTAINS	5	566	194
CYPRESS HILLS, CANADA	0	0	0
MILK RIVER BASIN	5	566	194
ST. MARY & MILK BASINS	7	276	152

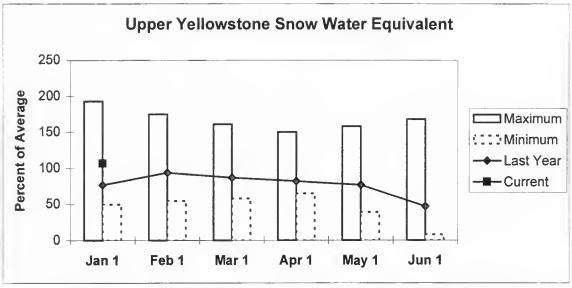
* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural volume - actual volume may be affected by upstream water management.

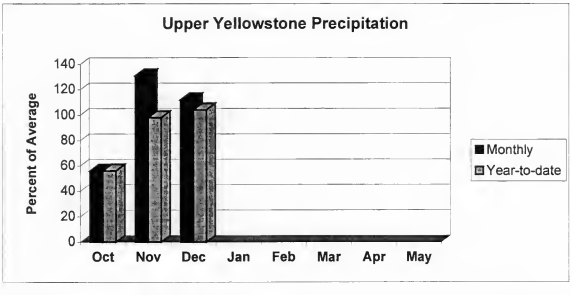
Upper Yellowstone River Basin

Snowpack conditions in the Upper Yellowstone River Basin were near average. Snow water content was 107 percent of average and 138 percent of last year.



January maximum swe was established in 1997 and minimum swe was in 1988; February maximum swe was in 1997 and minimum swe was in 1977; March maximum swe was in 1997 and minimum swe was in 1977; April maximum swe was in 1971 and minimum swe was in 1981; May maximum swe was in 1997 and minimum swe was in 1987; and June maximum swe was 1982 and minimum swe was in 1987 and 1994. Average is for the period 1961 through 1990.

Mountain precipitation during December was 111 percent of average and 175 percent of last year. Valley precipitation during December was 128 percent of average and 167 percent of last year. Mountain and valley water year precipitation, beginning October 1, 1998, was 104 percent of average and 121 percent of last year.



Mystic Lake storage was 67 percent of average and 115 percent of last year and Cooney storage was 121 percent of average and 90 percent of last year.

UPPER YELLOWSTONE RIVER BASIN
Streamflow Forecasts - January 1, 1999

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ====== Wetter ======>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
YELLOWSTONE at Lake Outlet	APR-JUL	548	631	687	120	743	826	573
	APR-SEP	723	830	903	114	976	1083	792
YELLOWSTONE RIVER at Corwin Spgs.	APR-JUL	1546	1737	1866	116	1995	2186	1609
	APR-SEP	1852	2070	2219	115	2368	2586	1937
YELLOWSTONE RIVER near Livingston	APR-JUL	1759	1997	2159	116	2321	2559	1855
	APR-SEP	2104	2386	2578	115	2770	3052	2241
SHIELDS RIVER nr Livingston	APR-JUL	29	83	120	74	157	211	162
	APR-SEP	34	94	135	75	176	236	179
BOULDER RIVER at Big Timber	APR-JUL	216	265	299	89	333	382	335
	APR-SEP	236	289	325	89	361	414	364
WEST ROSEBUD CREEK nr Roscoe (2)	APR-JUL	51	57	61	101	66	72	61
	APR-SEP	66	73	78	99	83	91	79
STILLWATER RIVER nr Absarokee (2)	APR-JUL	366	432	477	96	522	588	498
	APR-SEP	442	515	565	95	615	688	593
CLARKS FORK RIVER nr Belfry	APR-JUL	425	489	532	100	575	639	532
	APR-SEP	468	536	582	99	628	696	590
COONEY RESERVOIR Inflow (2)	APR-JUL	15.3	32	44	93	56	73	47
	APR-SEP	25	42	54	94	66	83	57
YELLOWSTONE RIVER at Billings (2)	APR-JUL	3038	3581	3950	110	4319	4862	3577
	APR-SEP	3699	4301	4710	112	5119	5721	4211

UPPER YELLOWSTONE RIVER BASIN
Reservoir Storage (1000 AF) - End of December

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
MYSTIC LAKE	21.0	7.8	6.8	11.6
COONEY	27.4	17.0	18.8	14.0

UPPER YELLOWSTONE RIVER BASIN
Watershed Snowpack Analysis - January 1, 1999

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
YELLOWSTONE ab LIVINGSTON	14	149	114
SHIELDS	4	104	74
BOULDER-STILLWATER	3	128	100
CLARK'S FORK-ROCK CREEK	8	133	109
UPPER YELLOWSTONE BASIN	25	138	107

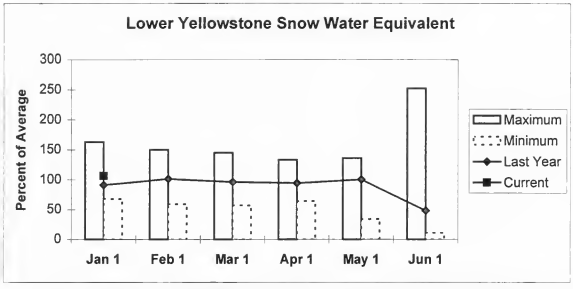
* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural volume - actual volume may be affected by upstream water management.

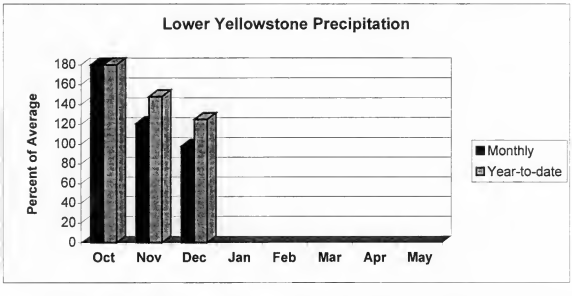
Lower Yellowstone River Basin

Snowpack conditions in the Lower Yellowstone River Basin, in Wyoming, were near average. Snow water content was 106 percent of average and 115 percent of last year.



January maximum swe was established in 1997 and minimum swe was in 1981; February maximum swe was in 1997 and minimum swe was in 1981; March maximum swe was in 1986 and minimum swe was in 1977; April maximum swe was in 1986 and minimum swe was in 1981; May maximum swe was in 1997 and minimum swe was in 1981; and June maximum swe was in 1995 and minimum swe was in 1994. Average is for the period 1961 through 1990.

Mountain and valley precipitation during December was 98 percent of average and 110 percent of last year. Mountain and valley water year precipitation, beginning October 1, 1998, was 125 percent of average and 129 percent of last year.



Bighorn Lake storage was 106 percent of average and 98 percent of last year and Tongue River storage was 22 percent of average and 97 percent of last year.

LOWER YELLOWSTONE RIVER BASIN
Streamflow Forecasts - January 1, 1999

Forecast Point	Forecast Period	<<= Drier = Chance of Exceeding * 90% (1000AF)	70% (1000AF)	Future Conditions 50% (Most Probable) (1000AF)	(% AVG.)	=Wetter =>> 30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
YELLOWSTONE RIVER at Billings (2)	APR-JUL	3038	3581	3950	110	4319	4862	3577
	APR-SEP	3699	4301	4710	112	5119	5721	4211
BIGHORN RIVER nr St. Xavier (2)	APR-JUL	1271	1546	1733	105	1920	2195	1645
	APR-SEP	1220	1690	1912	107	2134	2458	1794
LITTLE BIGHORN RIVER nr Hardin	APR-JUL	54	83	103	74	123	152	140
	APR-SEP	64	96	117	75	138	170	157
TONGUE RIVER Stateline nr Decker (2)	APR-JUL	86	141	179	78	217	272	230
	APR-SEP	105	163	202	79	241	299	256
YELLOWSTONE RIVER at Miles City (2)	APR-JUL	4471	5382	6000	111	6618	7529	5431
	APR-SEP	5088	6152	6880	110	7608	8542	6281
POWDER RIVER at Moorehead	APR-JUL	119	179	220	104	261	321	211
	APR-SEP	81	201	242	104	283	371	232
POWDER RIVER near Locate	APR-JUL	125	188	231	92	274	337	252
	APR-SEP	75	205	254	92	303	395	276
YELLOWSTONE RIVER nr Sidney (2)	APR-JUL	5050	6092	6800	115	7508	8550	5925
	APR-SEP	5587	6665	7510	110	8355	9880	6814

LOWER YELLOWSTONE RIVER BASIN
Reservoir Storage (1000 AF) - End of December

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
BIGHORN LAKE	1356.0	944.1	964.8	891.8
TONGUE RIVER	68.0	5.8	6.0	26.0

LOWER YELLOWSTONE RIVER BASIN
Watershed Snowpack Analysis - January 1, 1999

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
WIND RIVER (Wyoming)	11	122	112
SHOSHONE RIVER (Wyoming)	6	148	126
BIGHORN RIVER (Wyoming)	16	121	109
LITTLE BIGHORN (Wyoming)	2	84	75
TONGUE RIVER (Wyoming)	5	83	81
POWDER RIVER (Wyoming)	6	108	86
LOWER YELLOWSTONE BASIN	28	115	106

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

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(2) - The value is natural volume - actual volume may be affected by upstream water management.

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Montana
Basin Outlook Report

Natural Resources Conservation Service
Bozeman, MT